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SOME POSSIBILITIES IN THE STATISTICAL ANALYSIS OF CASE REPORTS OF VENEREAL DISEASES.¹

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In the campaign against venereal diseases a serious handicap has been experienced in the absence of certain fundamental statistical facts. These facts are available for most other important diseases, but, because of the lack of epidemiological studies and of the absence until recently of any system of case reports, they have not been collected for venereal diseases. Except for very small groups of persons no statistical data have been collected and analyzed for the purpose of showing the actual incidence of venereal diseases, the incidence among persons of different races and color, sexes, ages, marital condition, or among persons living under varying conditions of environment and social status. The only considerable amount of information which has been made available is that which exists in the records of physical examinations of selective service men in the war with Germany. Even this information covers only a few ages and relates only to males, is admittedly incomplete except for a fraction of those who were registered for service, and, so far, is only partially tabulated.

Without discussing the reasons for this absence of statistical facts, attention may be called briefly to the need for the fundamental data which statistics of this kind will afford, to some of the practical uses that may be made of them, and to the possibility of securing at least some of the most desired facts. In this connection, a few analyses of a limited number of venereal disease case reports are presented for illustrative purposes.

First, What is the practical need for statistical facts relating to venereal diseases?

As a program of preventive work progresses it becomes increasingly evident that the problems involved need to be defined more clearly. This clearer definition will be aided by answers to such questions as these: In what economic groups of our population do venereal diseases constitute the greatest menace? At what ages are their incidence and prevalence highest? With what social conditions are their prevalence most directly associated? What agencies can be utilized to the greatest advantage in preventive work among these persons of different sex, age, economic status, or other condition? A closer view of the actual situation in any population or population group will afford us a better knowledge of the lines along which preventive work can most efficiently be carried out. So far we have had to

¹ From the Statistical Office, prepared in cooperation with the Division of Venereal Diseases, United States Public Health Service. Special acknowledgments are made to Assistant Statistician Dean K. Brundage, under whose immediate supervision the tabulations were made.

proceed with only a very vague idea of the real limits of the problem. We knew only that the problem was one of tremendous magnitude and that the time had come to attack it with such weapons as we had. Our program included all of the means for offensive warfare that we could think of and invent. We have been compelled to adopt a very general method of attack. Now, what we need is not only a broadside but the chance to take better aim. If the problems involved are more clearly defined, our marksmanship will be greatly improved.

Second, What sources of information are available or can be made available?

Until quite recently the reporting of venereal diseases has been wholly negligible. Mortality records, upon which so much reliance is placed in epidemiological studies of other diseases, are almost worthless in this instance. What we need, and eventually will have, are the carefully analyzed results of thorough and fairly complete studies of the epidemiology of venereal diseases among considerable groups of our population, in order that the conditions and factors influencing their incidence and prevalence may be made known and evaluated with scientific accuracy. While the time may not yet be ripe for studies of this kind upon a large scale, we can, in the meantime, make such use of reports collected by State and municipal health departments as the records themselves warrant. As the reports improve in accuracy and completeness, a greater yield of information will be afforded.

With the idea of ascertaining what information can be secured from the case reports which States require of physicians and clinics, not only for the purpose of obtaining such statistical data as they afford, but also for the purpose of judging the relative value of the inquiries included on the forms ordinarily used, the Statistical Office of the Public Health Service is tabulating and analyzing the individual case reports of venereal diseases in several States. The projected tabulations will include many thousand cases and will, it is believed, prove to be of great value. The work has just been begun, and the results are not yet available. As an example, however, of some of the results which a tabulation of even a relatively small number of cases will yield, certain tables are presented here showing the variation in age incidence of venereal diseases in a number of cantonment zones in which the Public Health Service actively cooperated in public health administration during the war.

These case reports for persons of different colors and sexes have been tabulated according to reported age at the time of onset of gonorrhea and syphilis. Since the case reports are admittedly incomplete, no attempt has been made to compute any rates. But it was found possible to ascertain approximately the *relative*

variation according to age of venereal disease incidence by the following method: First, the percentages were computed of the total cases for each color and sex group which were in each age, thus affording percentage distribution according to age. Then the percentage distribution of the populations in each color and sex groups was found.² Finally, the percentage of cases in each age was divided by the percentage of this enumerated population. The resulting ratios, therefore, may be said to indicate the variation in incidence of either disease or all venereal diseases according to age for each color and sex groups. It should be kept in mind that on the accompanying charts *no rates* are shown but only the *indicated relative variations* in reported age of onset.

The results of the tabulation and analysis of these fragmentary data can not be considered in any sense as conclusive, but they do suggest the general nature of some of the information which a statistical analysis of a large number of records will afford. For example, the tabulation of the case reports from cantonment zones suggests the following:

1. That *under the conditions prevailing in the areas included in cantonment zones*, the highest incidence of venereal diseases occurred at an earlier age among females than among males. For white females the modal or peak age was 19 as contrasted with the ages 19 to 23, inclusive, for white males. For colored females the highest incidence occurred at the age of 17 as contrasted with the ages 19 to 22, inclusive, for colored males. Thus the highest incidence occurred about two years earlier among females than among males. Although only civilian cases are included, it is possible, if not probable, that conditions peculiar to the "camp towns" may account partially for this difference in incidence.

2. Comparing whites and Negroes, the suggestion is afforded that the age at which the greatest incidence of venereal diseases occurs is definitely earlier among Negroes.

3. Comparing the relative variations in incidence of gonorrhea and syphilis, the suggestion is afforded that for both males and females gonorrheal infections tend to occur at an earlier age than syphilitic. This difference may be more apparent than real for the reason that the age of onset presumably may be less accurately reported for syphilis than for gonorrhea and a larger proportion of syphilitic cases classified according to the age of report rather than age of onset.

² Since the populations in the cantonment zones were seriously affected by unusual conditions existing during the war, the 1910 census data, even were they available in the detail desired, were of doubtful value. But the results of enumerations of relatively large samples of the populations of four zones by the Public Health Service, made in connection with special field studies of influenza in the latter part of 1918, were available in detail and were used to supply the needed information on the age distribution of persons of either color and either sex.

TABLE I.—*Relative variations¹ in the incidence of venereal diseases, according to age, among persons of different color and sex.*

(Based on case reports in 14 cantonment zones.)

Reported age at onset.	White.		Colored.	
	Males.	Females.	Males.	Females.
Under 15.....	2	19	9	22
15.....	69	53	71	206
16.....	58	191	150	206
17.....	233	447	275	733
18.....	300	409	383	393
19.....	571	650	533	286
20.....	557	382	390	244
21.....	493	319	471	278
22.....	580	317	457	183
23.....	609	188	287	153
24.....	313	129	209	277
25-29.....	244	165	176	88
30-34.....	158	65	107	65
35-39.....	57	45	73	62
40-44.....	40	30	24	14
45 and over.....	22	20	16	18

¹The relative numbers in this table are a series of ratios obtained by dividing the percentage of total cases at each age by the percentage of the total population at the corresponding age. The population distribution used was that of sample areas in several of the cantonment zones in which special influenza surveys were made in 1918-19.

TABLE II.—*Relative variations¹ in the incidence of gonorrhea and of syphilis, according to age.*

(Based on case reports in 14 cantonment zones.)

Reported age at onset.	Gonorrhea.		Syphilis.	
	Males.	Females.	Males.	Females.
Under 15.....	4	22	6	18
15.....	45	111	103	164
16.....	132	333	79	44
17.....	300	885	166	351
18.....	446	383	272	450
19.....	693	536	333	407
20.....	579	310	362	317
21.....	476	247	494	326
22.....	568	265	523	237
23.....	415	208	602	165
24.....	305	211	247	207
25-29.....	202	109	240	152
30-34.....	112	54	169	93
35-39.....	55	26	82	77
40-44.....	33	8	37	32
45 and over.....	15	9	26	17

¹ The relative numbers in this table are a series of ratios obtained by dividing the percentage of total cases at each age by the percentage of the total population at the corresponding age. The population distribution used was that of the sample areas in several of the cantonment zones in which special influenza surveys were made in 1918-19.

Merely to suggest the possible use of more complete statistics, of this kind, a chart is presented in which are compared the relative variations in age incidence of venereal diseases, as shown by the cantonment reports, with the variations in the percentages of persons of corresponding ages who are attending school and who are married. The latter figures are taken from the Federal census reports for 1910

RELATIVE VARIATIONS IN THE INCIDENCE
OF VENEREAL DISEASES ACCORDING TO AGE
AMONG PERSONS OF DIFFERENT COLOR AND SEX
Based on Case Reports in 14 Cantonment Zones

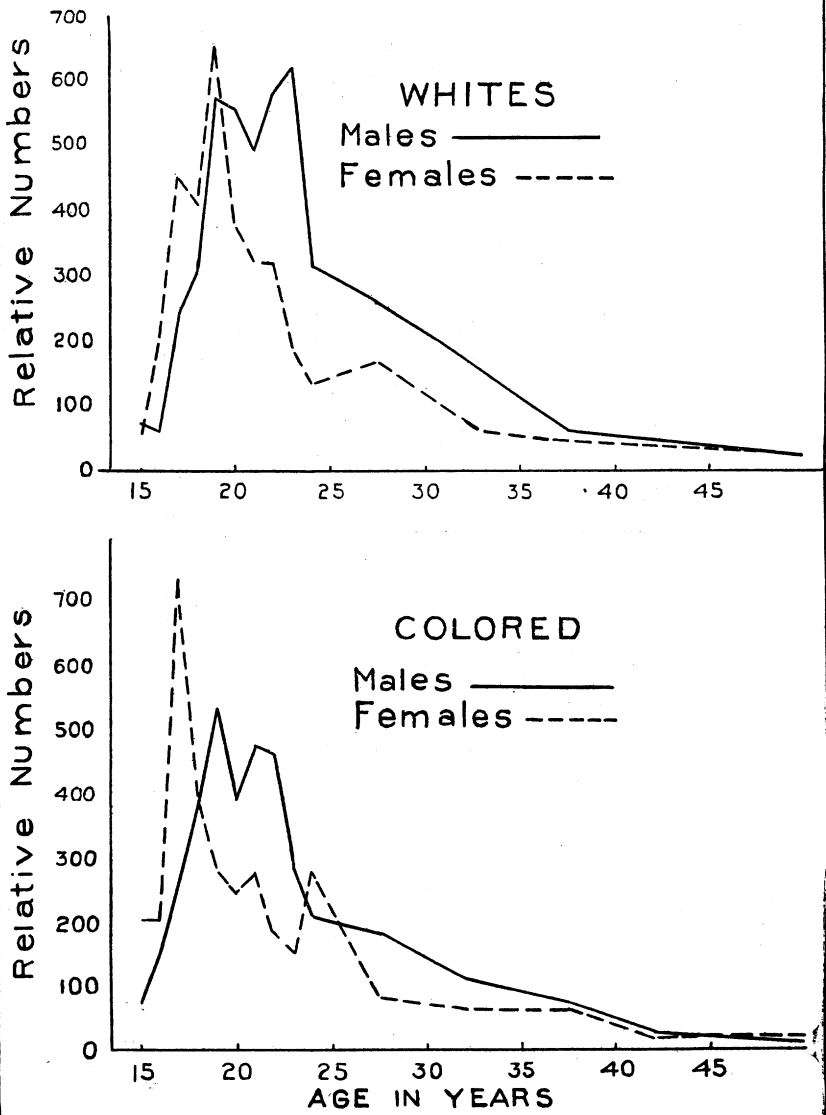


FIG. 1.

RELATIVE VARIATIONS IN THE INCIDENCE
OF GONORRHEA AND OF SYPHILIS AC-
CORDING TO AGE AMONG MALE AND FEMALE
Based on Case Reports in 14 Cantonment Zones.

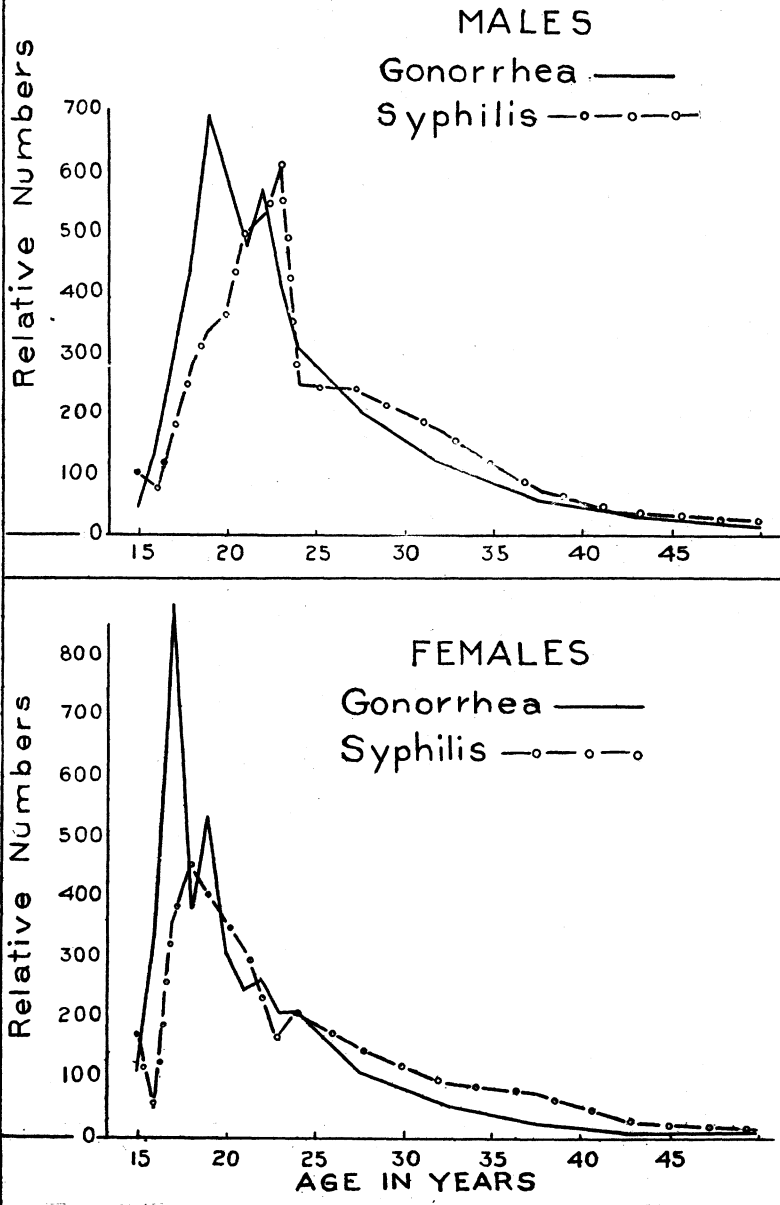


FIG. 2.

and, of course, are not strictly comparable with the data for venereal diseases. But the broad suggestion is afforded that, in the localities under consideration, venereal infections tend to occur most frequently at those ages when both males and females have finished their school attendance and before marriage. The sharp decline in school attendance is significant from the point of view of formal education

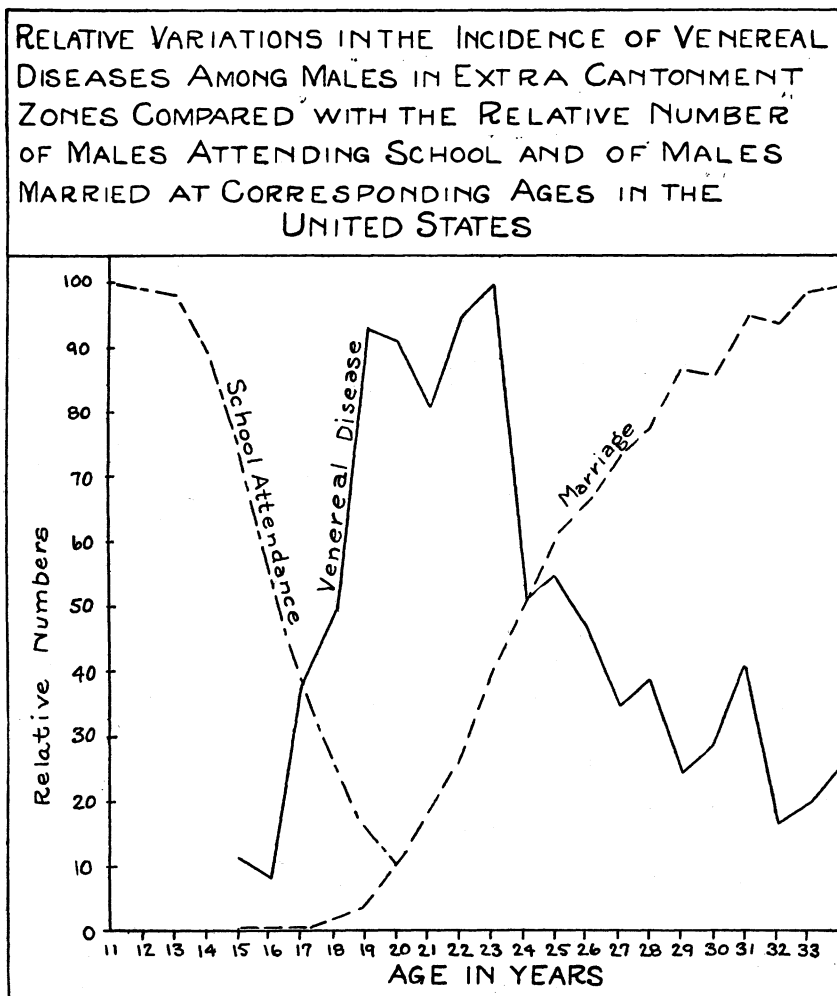


FIG. 3.

in the prevention of venereal infection. Quite clearly, if these preliminary statistics are corroborated by more complete data, children—especially children of that class of the population which we ordinarily suspect as being most subject to venereal disease infection—leave school long before they reach an age where education along these lines has been given. The high incidence of venereal diseases among persons at ages when it is economically

impracticable to undertake the responsibilities of marriage also helps to define the problem a little more clearly.

This is but a single illustration of some of the possible uses to which it is hoped a tabulation of a larger mass of more complete data may be placed. The onerous duty placed upon the physician and the clinician of filling out a somewhat detailed blank for each case is not altogether a useless one. When properly used, the records will be of great value and will, it is believed, not only lead to a more definite knowledge of the problems involved and suggest fields for more intensive studies of the factors and conditions influencing the prevalence of venereal diseases, but also make possible practical improvements in the forms used for the reporting of venereal disease cases. When we know something more about the incidence of venereal diseases among persons of different color, sex, and age in different economic, social, and racial groups, and living under varying environments, then it is quite certain that our preventive work will be more definitely outlined and more effectively directed.

TABLE III.—*Cases of venereal diseases reported in 14 extra-cantonment zones, classified according to color, sex, and reported age at onset.*

Reported age at onset.	Total.			White.			Negro.		
	Both sexes.	Male.	Female.	Both sexes.	Male.	Female.	Both sexes.	Male.	Female.
All known ages.....	2,302	1,861	441	1,181	958	223	1,121	903	218
Under 15.....	52	29	23	19	7	12	33	22	11
15.....	30	20	10	13	11	2	17	9	8
16.....	54	37	17	19	10	9	35	27	8
17.....	129	90	39	55	40	15	74	50	24
18.....	175	131	44	72	52	20	103	79	24
19.....	207	163	44	102	76	26	105	87	18
20.....	185	145	40	98	75	23	87	70	17
21.....	189	160	29	86	71	15	103	89	14
22.....	142	113	29	72	55	17	70	58	12
23.....	123	103	20	74	64	10	49	39	10
24.....	115	91	24	55	48	7	60	43	17
25.....	95	80	15	61	52	9	34	28	6
26.....	91	71	20	50	38	12	41	33	8
27.....	78	70	8	43	36	7	35	34	1
28.....	84	75	9	52	45	7	32	30	2
29.....	43	32	11	25	20	5	18	12	6
30.....	70	64	6	48	44	4	22	20	2
31.....	48	44	4	31	29	2	17	15	2
32.....	41	34	7	23	20	3	18	14	4
33.....	50	45	5	23	20	3	27	25	2
34.....	47	43	4	27	26	1	20	17	3
35.....	32	24	8	12	8	4	20	16	4
36.....	33	30	3	15	14	1	18	16	2
37.....	22	19	3	8	8	—	14	11	3
38.....	16	14	2	8	7	1	8	7	1
39.....	23	21	2	14	13	1	9	8	1
40.....	16	15	1	12	11	1	4	4	—
41.....	12	10	2	7	6	1	5	4	1
42.....	11	11	—	7	7	—	4	4	—
43.....	5	2	3	4	2	2	1	—	1
44.....	7	7	—	4	4	—	3	3	—
45.....	16	12	4	9	8	1	7	4	3
46 and over.....	61	56	5	33	31	2	28	25	3

TABLE IV.—Cases of gonorrhea reported in 14 extra-cantonment zones, classified according to color, sex, and reported age at onset.

Reported age at onset.	Total.			White.			Negro.		
	Both sexes.	Male.	Female.	Both sexes.	Male.	Female.	Both sexes.	Male.	Female.
All known ages.....	1,237	1,033	204	625	510	115	612	523	89
Under 15.....	26	15	11	14	5	9	12	10	2
15.....	11	7	4	4	3	1	7	4	3
16.....	38	24	14	14	7	7	24	17	7
17.....	85	58	27	39	27	12	46	31	15
18.....	109	90	19	43	33	10	66	57	9
19.....	129	107	22	64	49	15	65	58	7
20.....	110	92	18	59	48	11	51	44	7
21.....	95	84	11	41	33	8	54	51	3
22.....	80	66	14	38	29	9	42	37	5
23.....	59	48	11	31	27	4	28	21	7
24.....	66	55	11	33	30	3	33	25	8
25.....	49	44	5	29	27	2	20	17	3
26.....	47	37	10	28	21	7	19	16	3
27.....	40	38	2	20	18	2	20	20	.....
28.....	43	39	4	27	23	4	16	16	.....
29.....	19	15	4	12	11	1	7	4	3
30.....	38	36	2	28	27	1	10	9	1
31.....	22	21	1	13	12	1	9	9	.....
32.....	16	15	1	11	10	1	5	5	.....
33.....	24	20	4	8	6	2	16	14	2
34.....	19	18	1	8	8	.....	11	10	1
35.....	13	11	2	7	5	2	6	6	.....
36.....	15	14	1	6	5	1	9	9	.....
37.....	12	11	1	4	4	.....	8	7	1
38.....	7	7	.....	4	4	.....	3	3	.....
39.....	7	7	.....	4	4	.....	3	3	.....
40.....	10	10	.....	7	7	.....	3	3	.....
41.....	3	3	.....	3	3	.....	.....	.....	.....
42.....	10	10	.....	6	6	.....	4	4	.....
43.....	2	1	1	2	1	1	.....	.....	.....
44.....	1	1	.....	1	1	.....	.....	.....	.....
45 and over.....	32	29	3	17	16	1	15	13	2

TABLE V.—Cases of syphilis reported in 14 extra-cantonment zones, classified according to color, sex, and reported age at onset.

Reported age at onset.	Total.			White.			Negro.		
	Both sexes.	Male.	Female.	Both sexes.	Male.	Female.	Both sexes.	Male.	Female.
All known ages.....	889	668	212	468	366	102	412	302	110
Under 15.....	22	12	10	5	2	3	17	10	7
15.....	17	11	6	8	7	1	9	4	5
16.....	12	10	2	4	3	1	8	7	1
17.....	32	21	11	12	9	3	20	12	8
18.....	58	35	23	27	17	10	31	18	13
19.....	52	34	18	28	18	10	24	16	8
20.....	56	37	19	28	18	10	28	19	9
21.....	71	56	15	37	30	7	34	26	8
22.....	51	38	13	27	20	7	21	18	6
23.....	56	47	9	40	34	6	16	13	3
24.....	40	29	11	17	13	4	23	16	7
25.....	38	30	8	27	21	6	11	9	2
26.....	39	29	10	21	16	5	18	13	5
27.....	32	26	6	19	14	5	13	12	1
28.....	37	32	5	22	19	3	15	13	2
29.....	22	16	6	12	8	4	10	8	2
30.....	28	24	4	16	13	3	12	11	1
31.....	26	23	3	18	17	1	8	6	2
32.....	23	17	6	11	9	2	12	8	4
33.....	22	21	1	13	12	1	9	9	.....
34.....	23	21	2	15	14	1	8	7	1
35.....	16	11	5	5	3	2	11	8	3
36.....	15	13	2	8	8	.....	7	5	2
37.....	8	6	2	2	2	.....	6	4	2
38.....	8	6	2	3	2	1	5	4	1
39.....	16	14	2	10	9	1	6	5	1
40.....	4	3	1	3	2	1	1	1	.....
41.....	9	7	2	4	3	1	5	4	1
42.....	1	1	.....	1	1	.....	.....	.....	.....
43.....	3	1	2	2	1	1	1	.....	1
44.....	6	6	.....	3	3	.....	3	3	.....
45 and over.....	37	31	6	20	18	2	17	13	4